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ASME BPVC VI 2007 (2008 Addenda), Boiler & Pressure Vessel Code, Section VI, Recommended Rules for the Care and Operation of Heating Boilers, as required by the States of Alaska, Arizona, California, Illinois, Kansas, Missouri, Nebraska, New Hampshire, New Jersey, Ohio, Utah, et. alia.

AN INTERNATIONAL CODE

2007 ASME Boiler & Pressure Vessel Code

2008a Addenda

July 1, 2008

VI

RECOMMENDED RULES FOR THE CARE AND OPERATION OF HEATING BOILERS

ASME Boiler and Pressure Vessel Committee
Subcommittee on Heating Boilers
Subgroup on Care and Operation of Heating Boilers (SC IV)



The American Society of
Mechanical Engineers



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SUMMARY OF CHANGES

Addenda to the 2007 Edition of the Code are issued in the form of replacement pages. Revisions, additions, or deletions are incorporated directly into the affected pages. It is advisable, however, that all replaced pages be retained for reference.

Replace or insert the pages listed. Changes given below are identified on the pages by a margin note, **A08**, placed next to the affected area. Revisions to the 2007 Edition are indicated by **07**. For the listing below, the *Page* references the affected area. A margin note, **A08**, placed next to the heading indicates *Location*. Revisions are listed under *Change*.

The Record Numbers listed below are explained in more detail in "List of Changes in Record Number Order" following the Summary of Changes.

<i>Page</i>	<i>Location</i>	<i>Change (Record Number)</i>
xiii–xxiii	Roster	Updated to reflect 2008 Addenda
1, 2	1.05, Subsection A	In definition of <i>boiler horsepower</i> , last line corrected by errata (07-537)

LIST OF CHANGES IN RECORD NUMBER ORDER

Record Number	Change
07-537	Errata correction.

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A08

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1. GENERAL

1.01 SCOPE

This portion of the rules is intended to cover general descriptions, terminology, and basic fundamentals of heating boilers, controls, and automatic fuel burning equipment. Because of the wide variety of makes and types of equipment in use, it is general in scope.

1.02 USE OF ILLUSTRATIONS

The illustrations used in this Section have been selected to show typical examples of the equipment referred to in the text and are not intended to endorse or recommend any one manufacturer's product; nor are the illustrations intended to be used as design criteria or as examples of preferred configurations of equipment.

1.03 MANUFACTURER'S INFORMATION

For detailed information on any specific unit, the Manufacturer's information should be consulted.

1.04 REFERENCE TO SECTION IV

The boilers discussed in this Section will be those limited to the operating ranges of Section IV, Heating Boilers, of the ASME Boiler and Pressure Vessel Code as follows:

- (a) steam boilers for operation at pressure not exceeding 15 psi (100 kPa)
- (b) hot water heating and hot water supply boilers for operation at pressures not exceeding 160 psi (1 100 kPa) and/or temperatures not to exceed 250°F (120°C)

1.05 GLOSSARY OF TERMS

For terms relating to boiler design, refer to Section IV, Heating Boilers, Appendix E, Terminology. For terms relating to boiler water treatment, refer to 9.12 of this Section, Glossary of Water Treatment Terms.

A08 A. Boilers and General Terms

absolute pressure: pressure above zero pressure, the sum of the gage and atmospheric pressures.

accumulator (steam): a pressure vessel containing water and steam that is used to store the heat of steam for use

at a later period and at some lower pressure.

air purge: the removal of undesired matter by replacement with air.

air vent: a valve opening in the top of the highest drum of a boiler or pressure vessel for venting air. Also a device, manual or automatic, that will effect the removal of air from a steam or hot water heating system. It is usually located at the highest point in the system.

allowable working pressure: the maximum pressure for which the boiler was designed and constructed.

altitude gage: a pressure gage calibrated in feet, indicating the height of the water in the system above the gage; usually found as combination pressure, altitude, and temperature gage.

ambient temperature: the temperature of the air surrounding the equipment.

baffle: a plate or wall for deflecting gases or liquids.

base: support for boiler.

beaded tube end: the rounded exposed end of a rolled tube when the tube metal is formed over against the sheet in which the tube is rolled.

belled tube end: see *flared tube end*.

bellows seal: a seal in the shape of a bellows used to prevent air or gas leakage.

blind nipple: a nipple, or a short piece of piping or tube, closed at one end.

blowdown: the difference between the opening and closing pressures of a safety or safety relief valve.

blowoff valve: a valve or cock in the bottom and/or near the water line of a boiler, that, when opened, permits free passage of scale and sediment during the blowoff operation.

boiler: a pressure vessel that incorporates a fuel input device or mechanism to heat water for space heating or other purposes or to convert water into steam for use in an external distribution system.

(a) *watertube*: a boiler in which the tubes contain water and steam, the heat being applied to the outside surface.

(1) *bent tube*: a watertube boiler consisting of two or more drums connected by tubes, practically all of which are bent near the ends to permit attachment to the drum shell on radial lines.

(2) *horizontal*: a watertube boiler in which the main bank of tubes is straight and on a slope of 5 deg to 15 deg from the horizontal.

(3) *sectional header*: a horizontal boiler of the longitudinal or cross drum type, with the tube bank composed of multiple parallel sections, each section made up of a front and rear header connected by one or more vertical rows of generating tubes and with the sections or groups of sections having a common steam drum.

(4) *box header*: a horizontal boiler of the longitudinal or cross drum type consisting of a front and a rear inclined rectangular header connected by tubes.

(5) *cross drum*: a sectional header or box header boiler in which the axis of the horizontal drum is at right angles to the center lines of the tubes in the main bank.

(6) *longitudinal drum*: a sectional header or box header boiler in which the axis of the horizontal drum or drums is parallel to the tubes in a vertical plane.

(7) *low head*: a bent tube boiler having three drums with relatively short tubes in the rear bank.

(b) *firetube*: a boiler with straight tubes that are surrounded by water and steam and through which the products of combustion pass.

(1) *horizontal return tubular*: a firetube boiler consisting of a cylindrical shell, with tubes inside the shell attached to both end closures. The products of combustion pass under the bottom half of the shell and return through the tubes.

(2) *locomotive*: a horizontal firetube boiler with an internal furnace, the rear of which is a tubesheet directly attached to a shell containing tubes through which the products of combustion leave the furnace.

(3) *horizontal firebox*: a firetube boiler with an internal furnace the rear of which is a tubesheet directly attached to a shell containing tubes. The first-pass bank of tubes is connected between the furnace tubesheet and the rear head. The second-pass bank of tubes, passing over the crown sheet, is connected between the front and rear end closures.

(4) *refractory lined firebox*: a horizontal firetube boiler, the front portion of which is set over a refractory or water-cooled refractory furnace. The rear of the boiler shell has an integral or separately connected section containing the first-pass tubes through which the products of combustion leave the furnace, then return through the second-pass upper bank of tubes.

(5) *vertical*: a firetube boiler consisting of a cylindrical shell, with tubes connected between the top head and the tubesheet, that forms the top of the internal furnace. The products of combustion pass from the furnace directly through the vertical tubes.

Submerged vertical is the same as the plain type above, except that by use of a waterleg construction as a part of the upper tubesheet, it is possible to carry the waterline at a point above the top ends of the tubes.

(6) *scotch*: in stationary service, a firetube boiler consisting of a cylindrical shell, with one or more cylindrical internal furnaces in the lower portion and a bank of tubes attached to both end closures. The fuel is burned in the furnace, the products of combustion leaving the rear to return through the tubes to an uptake at the front head: known as dry-back type.

In marine service, this boiler has an internal combustion chamber of waterleg construction covering the rear end of the furnace and tubes, in which the products of combustion turn and enter the tubes: known as wet-back type.

(c) *modular*: a steam or hot water heating boiler assembly consisting of a grouping of individual boilers called modules, intended to be installed as a unit, with a single inlet and a single outlet. Modules may be under one jacket or individually jacketed.

(d) *vacuum*: a factory-sealed steam boiler that is operated below atmospheric pressure.

(e) *boiler, steam heating*: a boiler designed to convert water into steam, that is supplied to an external space heating system.

(f) *boiler, hot water heating*: a boiler designed to heat water for circulation through an external space heating distribution system.

(g) *boiler, hot water supply*: a boiler used to heat water for purposes other than space heating.

boiler horsepower: the evaporation of 34.5 lb (15.6 kg) of water per hour from a temperature of 212°F (100°C) into dry saturated steam at the same temperature equivalent to 33,475 Btu/hr (9.8 kW).

boiler inspection: boilers that are fabricated are usually inspected during construction for compliance with Code design requirements. They are also periodically field inspected internally and externally for corrosion or scaling and for the condition of controls, safety devices, etc. Boilers that are cast are given a hydrostatic test only (each section or the complete boiler); a visual inspection by the Authorized Inspector is not required unless local jurisdictions require periodic field inspections.

boiler layup: any extended period of time during which the boiler is not expected to operate and suitable precautions are made to protect it against corrosion, scaling, pitting, etc., on the water and fire sides.

boiler trim: piping on or near the boiler that is used for safety, limit, and operating controls, gages, water column, etc.

bond: a retaining or holding high-temperature cement for making a joint between brick or adjacent courses of brick.

boss: a raised portion of metal of small area and limited thickness on flat or curved metal surfaces.

breeching: a duct for the transport of the products of combustion between the boiler and the stack.

bridgewall: a wall in a furnace over which the products of combustion pass.

